

**UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF OHIO  
WESTERN DIVISION**

United States of America, et al.,	)	
Plaintiffs,	)	
	)	
	)	
v.	)	<b>Case No. 1-02-107</b>
	)	Judge S. Arthur Spiegel
	)	
The Board of County Commissioners	)	
of Hamilton County, Ohio and The City of	)	
Cincinnati,	)	
Defendants.	)	

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**THIRD DECLARATION OF BRUCE A. BELL, Ph.D., P.E., DEE**

I, Bruce A. Bell, state and declare as follows:

1. I am over 18 years of age and am competent to testify regarding the following:
2. I am president of Carpenter Environmental Associates, Inc. of Monroch, New York, an environmental engineering and science firm. I hold a Bachelor's degree in civil engineering, a Master's degree in environmental engineering, and a Ph.D. in environmental engineering, all from New York University. I am a registered professional engineer in New York and New Jersey. I am a Diplomate of the American Academy of Environmental Engineers and serve on the committee that prepares the written and oral qualifying examinations in water supply and wastewater for the Academy. I have over 34 years experience in the field of environmental engineering with expertise in wastewater collection and treatment. My experience includes the design and evaluation of collection systems, wastewater treatment plants and teaching of courses in environmental engineering

at the undergraduate and graduate levels. My curriculum vita is attached as Appendix A.

3. I have approximately 30 years of experience providing litigation support in Clean Water Act enforcement actions. I have worked with USEPA and USDOJ as an expert witness since the early 1970s. I have participated in cases that have gone to trial where I provided expert witness testimony. The majority of cases in which I have been involved have settled. In those cases, I participated in settlement negotiations and assisted the parties in preparing the technical portions of Consent Decrees. In addition, I have provided similar services to citizen plaintiffs in Clean Water Act citizen suits since approximately 1980.
4. This is my third declaration in this case. The first addressed MSD's history of SSOs and sewage in basement backups, compared that history to national benchmarking studies, and addressed reasons why the Interim Partial Consent Decree (IPCD) would not result in timely compliance with the provisions of the Clean Water Act. My second Declaration addressed in more detail the deficiencies of the IPCD, including the provision allowing delay of full compliance at SSO 700 for many years. Copies of these earlier Declarations are attached as Appendices B and C.
5. The Consent Decree fails to comport with the May 19, 1998, Memorandum from Robert Perciasepe, Assistant Administrator, Office of Water, Re: Implementation of the CSO Control Policy, which was attached to EPA's report to Congress. In that memorandum Mr. Perciasepe wrote: "The long-term control plan should include a fixed-date implementation schedule" (emphasis added). The Consent Decree does not include a fixed-date implementation schedule, i.e., a non-extendable final completion date, for the vast majority of remedial measures, other than for the relatively few SSO and CSO projects specified in the Decree itself. Rather, the Decree allows extensions of the compliance dates for a variety of reasons. Since EPA requires a non-extendable final compliance date for CSOs, which are legal discharges under the Clean Water Act, then, at a minimum, a non-extendable final compliance date is also required for SSOs and wastewater treatment plant violations, which are illegal.

6. The 2<sup>nd</sup> Consent Decree, which incorporates the IPCD, has a number of provisions in which the Defendants can trigger extensions of the current schedule for fixing CSOs, SSOs and WWTPs, based upon subjective, un-defined determinations. Examples of these deficiencies are presented below. This complexity requires significant administrative and oversight effort.
7. The 2<sup>nd</sup> Decree also anticipates that Defendants will request and receive changes in water quality standards, assumes that state, federal, and interstate regulations and/or policies will change and, if they do not, the Decree allows for extensions of the compliance end dates. These issues are unrelated to illegal SSOs and violations at the MSD's WWTPs. Furthermore, the Decree allows for anticipated, estimated costs to be used to extend the compliance end dates.
8. Because of complexity of the 2<sup>nd</sup> Consent Decree, as noted throughout, both as described above in paragraph 5 and in the following paragraphs, significant time and resources must be expended to monitor and administer the Consent Decree. Based on my analysis of the facts and my background and experience, it is my opinion that the regulatory agencies have not in the past had or applied sufficient resources to ensure compliance with the Clean Water Act, despite a State administrative enforcement action in 1992.
9. In 1992, the Ohio Environmental Protection Agency issued a Director's Final Findings and Order (DFFO), which required Defendants to submit a plan with deadlines to eliminate all capacity related SSOs. Based upon information available to me, Defendants have never submitted such a plan with deadlines for elimination of all SSOs.
10. In the following paragraphs, I present examples of the complexity and limitations of the Consent Decree. I made no attempt to describe all of the provisions of the Consent Decree that result in complexity, unilateral extensions of time by the Defendants, or multiple loops of extensions built into the decree. Rather, I highlight several significant issues that I believe point out the need for a Special Master.
11. Section VII.B of the Consent Decree is based on an assumption that Defendants will be successful in obtaining revised (lowered) water quality standards and that

there will be unspecified revisions to EPA CSO Policies or the regulations resulting from those policies. Section VII.B of the Consent Decree allows Defendants to extend the compliance date beyond February 28, 2022, if Defendants are NOT successful in obtaining revised water quality standards and/or if certain unspecified changes to the regulations do not occur.

12. Allowing Defendants to spend significant money and time to develop a Long Term Control Plan update based on the speculative assumption that undefined changes to designated uses, water quality standards, and regulations will occur and will be approved by the State and EPA will likely result in unnecessary delays in compliance.
13. Defendants appear to be able to obtain delays in compliance end-dates simply because Defendant's expectations of regulatory changes referred to above, were not met. In addition, this provision, if supported at all, is only supported by the federal CSO Policy, which does not apply to SSOs, illegal treatment plant by-passes, pump station overflows and effluent violations at POTWs.
14. The Consent Decree provision allowing compliance to be delayed if changes to regulations, designated uses, and/or water quality changes do NOT occur, places the regulators in a position of having to make a Hobbsian choice. EPA and the State would be required to make or approve such changes. The regulators would then be placed in a position where approval of less stringent requirements would prevent delays in MSD compliance projects, but failure to approve such changes (lower Water Quality Standards) would result in delays in construction of remedial measures.
15. Under the best of circumstances, if Section VII.B of the Consent Decree is approved by the Court, significant oversight will be required to insure that Defendants do not intentionally or unintentionally create delays by failing to do everything required to support a request for modification of water quality standards and that delays in the ultimate compliance date are really the result of failure to obtain the undefined changes in regulations. This level of oversight effort would be best performed by a Special Master with appropriate engineering,

financial, and legal support. This is particularly true because: 1) the assumed changes in water quality standards and regulations are not defined in the Consent Decree; and, 2) EPA would have to approve both the changes sought by Defendants and the time extension sought by Defendants.

16. The monetary cap on construction costs in Para. IX. B. creates the potential for significant abuse resulting in major extensions of the compliance end date. Dr. Kavanaugh has discussed this in his Declaration. I fully concur with Dr. Kavanaugh.
17. The Consent Decree treats CSOs and SSOs similarly. CSOs can be permitted discharges while SSOs are *per se* illegal. The Consent Decree applies the regulatory flexibility that can be allowed for CSOs under the CSO policy to SSOs and to POTWs that consist solely of sanitary sewers. Under the CSO Policy, Long Term Control Plans are required for and apply to only combined sewer systems. Discharges through permitted CSO discharge points during wet weather are allowed, if they do not violate Water Quality Standards and apply the Nine Minimum Controls (technology-based standards). Violations of effluent limits at POTWs and SSOs and pump stations are not legal. These violations can and should be remedied as soon as possible, without applying regulatory flexibility allowed under the CSO Policy.
18. The Sycamore Creek wastewater treatment plant treats only wastewaters conveyed by sanitary sewers. There are no combined sewers tributary to Sycamore Creek. Sycamore Creek has violated effluent limitations for a variety of pollutants numerous times during 2003. For example, Sycamore Creek was in violation of its effluent limitations for total suspended solids over 36% of the days in 2003. Wastewater at Sycamore Creek bypassed secondary treatment almost 15% of the days in 2003 resulting in over 213 million gallons of sewage bypassing secondary treatment. Yet, the Consent Decree allows remedies at Sycamore Creek to be extended due to assumed regulatory changes and MSD's estimated costs, despite not being eligible for the flexibility allowed by the CSO

Policy. In my opinion, this is inappropriate. I have not seen this done by the EPA before.

19. Remedies for SSOs upstream of combined portions of the sewer system must be identified prior to being able to develop a Long Term Control Plan for the combined sewer system. For example, SSO 700 is just upstream of a combined portion of the sewer system. The sewage flows that will be imposed upon the combined sewer system downstream of SSO 700 will be significantly different, if the remedy for SSO 700 is a full secondary treatment plant, which is my recommendation (supported by MSD's own internal document), infiltration/inflow control, storage, or larger sewers to convey the wet weather flows downstream to the combined sewer system.
20. Once the remedy for SSO 700 is identified, this illegal discharge should be eliminated without the necessity to, for example, perform a use attainability analysis, which would be required to change the designated use of Mill Creek. Regardless of whether or not the designated use of Mill Creek is ultimately changed, elimination of SSO 700 is, and will continue to be, required because the Clean Water Act prohibits discharge of sanitary sewage without a NPDES permit.
21. The Consent Decree has few, if any, milestone dates by which progress towards compliance can be tracked. Most efforts are without any milestone dates until the final compliance date. Typically, Consent Decrees contain milestone dates such as start and end dates for design, dates by which notice to proceed with construction must be issued to the successful bidder, and completion of construction.
22. The lack of milestones means that much more effort will be required to track the progress towards compliance and to ensure that the Court is made aware at the earliest possible date of delays that endanger the compliance end dates. Without such tracking, the opportunity to require actions by Defendants (until it is too late to prevent delays in the compliance date) is missing or severely limited. A Special

- Master would have the time and can be provided with the resources to track progress and bring to the Court's attention required actions to avoid delays.
23. Establishing milestones for SSOs and treatment plant violations in the Long Term Control Plan process is improper because the flexibility allowed under the CSO Policy is not applicable to these other violations.
24. The IPCD requires installation of a Chemically Enhanced High Rate Settling (CEHRS) and storage facility as an interim treatment measure at SSO 700. SSO 700 is a highly active SSO that frequently discharges raw sewage in large volumes. It is the largest SSO in the MSD system, discharging upwards of 75 million gallons of untreated sewage per year to the Mill Creek. The treatment provided by the CEHRS is less than the secondary treatment required by the CWA and EPA regulations. The CEHRS system is discussed in greater detail in my Second Declaration (Appendix C).
25. In Mark Klingenstein's latest affidavit, he states that changes to the interim treatment system and the amount of storage proposed by Defendants will negate much of the environmental harm currently being caused by SSO 700. No studies supporting these assertions have been provided to Sierra Club, so such conclusions remain in the realm of speculation and do not on their face rise to the level of reasonable engineering certainty.
26. However, I can state to a reasonable degree of engineering certainty, that the SSO 700 interim treatment system, which Defendants propose to operate until 2016 or 2021, does not meet the CWA's required Secondary Treatment standards and does not meet the regulations required to obtain a NPDES permit.
27. It is clear that Defendants themselves have considered and evaluated construction of a full secondary treatment plant at SSO 700, which would meet secondary treatment standards and would reduce the load on the downstream treatment plant (see Appendix D).
28. The cost for a secondary treatment plant at SSO 700 is also significantly below the costs for the Mill Creek Tunnel, which is a flood control tunnel. Based upon my education and experience, it is technically and economically feasible to design



- and build a secondary treatment plant at SSO 700 within five years, rather than waiting until 2021 to eliminate this illegal discharge.
29. Furthermore, the Consent Decree approves a plan to add a CEHRS system, like the one proposed at SSO 700, onto the existing, overloaded, Sycamore secondary treatment plant as a means of providing treatment to the plant's excessive by-passes.
30. Instead of fully enlarging the Sycamore Plant to treat all sewage flows with the level of treatment required by the Clean Water Act, the Consent Decree allows MSD to split the flows into a CEHRS treatment and secondary treatment stream. See Klingenstein Affidavit, Paras. 151- 157.
31. The use of CEHRS treatment "add-ons" at sanitary-only, municipal sewage treatment plant does not meet the requirements of the regulations. The Clean Water Act requires that all municipal sewage coming to the plant be provided with secondary treatment. In extraordinary circumstances, by-passing is permitted to prevent serious loss of property or life.
32. However, when historical data shows that the influent flows to the plant are typically far greater than the plant can handle (as is the case, here), then the plant must be expanded to provide full secondary treatment to the flows.
33. I have seen no evidence that it would be infeasible to expand the Sycamore Plant to provide full secondary treatment for all influent flows
34. Section VII.C of the Consent Decree allows monitoring of completed construction and, if goals are not being achieved, Defendants are permitted to request an extension of the compliance date to modify projects that have been built but failed to meet the desired end. There is no limit to the number or length of extensions that Defendant's may request. Such post construction monitoring and reevaluation of projects is consistent with EPA's CSO Policy. Application of this provision to elimination of SSOs, plant bypasses, and POTW effluent violations is not consistent with EPA policy and should not be permitted under the Consent Decree.



35. Section VII.C. of the Consent Decree is ripe for abuse and will require significant monitoring resources. It would be easy for Defendants to plan, design, and construct the absolute minimum facilities that might have a chance of meeting water quality standards and then extend the compliance date significantly when water quality standards are not met using this section of the Consent Decree. To prevent this, careful review of the Long Term Control Plan Update and the projects designed under it is required. Section VII.C. of the Consent Decree is ripe for abuse and will also require significant monitoring resources. It would be easy for Defendants to plan, design, and construct the absolute minimum facilities that might have a chance of meeting water quality standards and then extend the compliance date significantly when water quality standards are not met using this section of the Consent Decree. To prevent this, careful review of the Long Term Control Plan Update and the projects designed under it is required.
36. The Consent Decree allows Defendants to not meet the February 28, 2022 compliance deadline if Defendants demonstrate that the remedial measures in the Long Term Control Plan Update and the CAPP are expected to exceed \$1.5 billion. Defendants do not have to have spent the \$1.5 billion but merely to demonstrate that the costs are expected to exceed \$1.5 billion. EPA would then be forced to either accept Defendants' costs or prepare their own cost estimate to dispute that of Defendants. The engineering work necessary to develop credible cost estimates of projects of this magnitude is substantial. Based upon my experience in cost estimating wastewater conveyance and treatment projects, the effort will easily exceed \$100,000.
37. It is my experience that regulatory agencies do not have sufficient resources to carry out this detailed level of review. A Special Master, provided with appropriate resources, can provide the necessary level of review and ensure that any delays, which might occur, are truly necessary.
38. I am currently involved in a Federal Court ordered remediation of a contaminated site involving a Special Master. The Court ordered remediation of

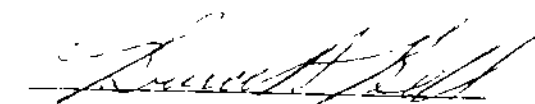
the site as expeditiously as possible. The Court appointed Senator Torricelli as a Special Master to oversee the remediation and to ensure that it proceeded as rapidly as possible. The Special Master was provided with his own engineering and legal consultants to support his efforts. The process has been ongoing for over a year now and will result in a remediation estimated at almost three quarters of billion dollars in less than 6 years. To date, the process has been extremely successful. It has resulted in the remediation progressing at a rapid pace and has successfully avoided the need for the Court to resolve disputes. All disputes to date have been informally resolved by the Special Master.

39. In my opinion, the complexity of these Consent Decrees, combined with ability of Defendants to unilaterally and subjectively initiate significant delays, if approved by the Court strongly argues for the appointment of a Special Master to ensure that compliance is achieved in the shortest time frame possible and that delays are kept to a minimum.

My opinions set forth above are stated to a reasonable degree of engineering certainty.

Pursuant to 28 U.S.C. 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed on this day the 29<sup>th</sup> of April 2004.



Bruce A. Bell Ph.D., P.E., DEE

## **APPENDIX A**

**CARPENTER ENVIRONMENTAL ASSOCIATES, INC.  
CEA ENGINEERS, P.C.  
CURRICULUM VITAE**

**BRUCE A. BELL, Ph.D., P.E., DEE, PRESIDENT**

**EDUCATION**

B.S. Civil Engineering, New York University, 1968  
M.S. Civil Engineering, New York University, 1969  
Ph.D. Environmental Engineering, New York University, 1974

**REGISTRATION**

Registered professional engineer in New York and New Jersey  
Diplomate, American Academy of Environmental Engineers

**PROFESSIONAL HISTORY**

**President, Carpenter Environmental Associates, Inc., Monroe, New York, 1978 - present**  
Promoted to President in 1991.

Responsible for technical direction of all engineering activities of the firm including:

**Wastewater/Storm Water**

- Design and supervision of construction for the upgrading of municipal sewage treatment plants.
- Design of several small private wastewater treatment plants.
- Collection system evaluations: CSO/SSO.
- Operational evaluation, process testing and review, and troubleshooting of POTWs.
- Facility Planning review and analysis.
- Conceptual design for biological nutrient removal.
- Evaluation of biological nutrient removal alternatives.
- Waste treatability studies for industrial wastes.
- Sludge treatment and management evaluations.
- Water quality modeling; Waste assimilative capacity studies.
- Storm water runoff modeling.
- NPDES permitting, comments, negotiations, and appeals.
- Industrial pretreatment studies and implementation of industrial pretreatment programs.
- Preparation of storm water management plans and Storm Water Pollution Prevention Plans.

**Site Assessments/Hazardous Materials**

- SPCC/DPCC Plans.
- Hazardous waste site assessment and remediation.
- Preparation and evaluation of environmental impact statements.
- RCRA closures.

**Air**

- Air permitting, comments, negotiations, and appeals.

**Litigation Support**

- Technical litigation support and expert witness testimony at deposition and trial in federal and state courts.

**Associate Professor and Professor of Engineering, The George Washington University, Washington, D.C., 1978 - 1987**

Promoted to Professor of Engineering in 1982.

Responsible for the University's environmental engineering program.

Directed both graduate and sponsored research.

Taught undergraduate and graduate courses in water supply, wastewater treatment, industrial waste treatment, sanitary engineering design, hydraulics, environmental chemistry, principles of environmental engineering, and environmental impact assessment.

Served as visiting research scientist and consultant at the U.S. Army Medical Bioengineering Research and Development Laboratory.

**Project Manager and Vice President, Flood & Associates, Inc., Consulting Engineers of Jacksonville, Florida, 1975 - 1978**

Promoted to vice president and director of environmental engineering design in 1976.

Responsible for the technical and financial aspects of all of the firm's environmental engineering design projects.

Served as project manager for numerous major treatment plant and pumping station design projects including: design of a 20 MGD advanced wastewater treatment plant which included phosphorous removal, nitrification, denitrification, filtration and ozonation, as well as sludge incineration and lime recovery through recalcination; design of the upgrading and expansion of a 10 MGD lime water softening plant; design of sludge and solids handling systems for a 35 MGD municipal wastewater treatment plant; design of a 5 MGD pure oxygen expansion for a combined municipal/brewery waste treatment plant; design of a 15 MGD activated sludge plant; and design of several large wastewater pumping stations.

Responsible for review of technical content of the firm's 201 Facilities Plans and sludge management studies.

Directed the firm's efforts as consultant to the Commonwealth of Virginia in the research, development, planning, and design related to the contamination of the James River and Hopewell wastewater treatment plant with the pesticide Kepone.

Responsible for the preparation of alternative analysis for the remediation of Kepone contamination of the Hopewell wastewater treatment plant.

Directed research efforts in Kepone biodegradation and incineration.

**Systems Manager, Envirotech Corporation, Belmont, California, 1973 - 1975**

Responsible for profit and loss for chemical-physical and advanced wastewater treatment systems, including thermal and solids handling systems and carbon regeneration systems.

Provided marketing and technical sales support, as well as application engineering.

Responsible for allocation and management of research and development funds in the area of advanced wastewater treatment.

Directed pilot studies in the areas of advanced wastewater treatment, carbon regeneration, and thermal sludge disposal. Carried out research into carbon adsorption and regeneration.

Responsible for process and system designs for solids handling systems and advanced wastewater treatment systems.

**Instructor of Civil Engineering, New York University, New York, 1969 - 1973**

Taught sixteen different courses in Civil and Sanitary Engineering.

Maintained active consulting practice in environmental engineering.

Consulting activities included wastewater treatability studies, pilot plant investigations, design of industrial pretreatment facilities, lake evaluations, and environmental impact analysis.

**AFFILIATIONS**

Water Environment Federation

International Water Association

American Society of Civil Engineers

American Academy of Environmental Engineers

**HONORS**

Diplomate of the American Academy of Environmental Engineers

Member of Tau Beta Pi, Chi Epsilon, and Perstare et Praestare honor societies

Received the Founders Day Award and Hydraulics Prize from New York University

Received the Outstanding Design Achievement Award from the Florida WPCA

Nominated for the WPCF Eddy Medal for paper on Munitions Waste Treatment

Listed in **Who's Who in the South and Southwest, International Who's Who in Engineering, and American Men and Women of Science**

### **PROFESSIONAL ACTIVITIES**

Served as a reviewer for WPCF (WEF) Manuals of Practice for Sludge Thickening, Nutrient Removal, and Sludge Conditioning.

Member of ASCE publication review committee (1979 - ).

Member WPCF Technical Practices Committee (1977 - 1988).

Reviewer, Research and Equipment proposals, NSF (1979 - 1988).

Member Program Committee and Conference Co-chair, Seminar on Development and Assessment of Environmental Quality Standards, American Academy of Environmental Engineers (1981).

Faculty, short course on Hazardous Waste Management, Harvard School of Public Health (1982).

Faculty, short courses on Hazardous Waste Management in the 80's, American Public Health Association (1983).

Conference Co-Chairman, Conference on the Treatment of Metal Bearing Wastewaters, NRDC/Texas Instruments, Inc., Mansfield, MA. (1985).

State Membership Chairman, American Academy of Environmental Engineers (1985 - 1987).

Faculty member and developer of course materials, Industrial Pretreatment Enforcement - A Workshop for POTW Attorneys, USEPA and Environmental Law Institute (1990 - 1992).

Faculty member New England Judges' Conference on Environmental Law, Environmental Law Institute, (1991).

Faculty member, New Jersey Judicial College (1992).

Course developer and faculty member "Basic Enforcement Skills," USEPA National Environmental Training Institute, (1992-1993).

Member, Nitrogen Technical Advisory Committee, New York City Department of Environmental Protection (1994 - ).

Member, Technical Review Committee for upgrading of Passaic Valley Sewerage Commissioners 330 mgd pure oxygen treatment plant, Newark, New Jersey (1995 - 2000)

Adjunct Professor, taught graduate course - Analysis of Receiving Waters, New Jersey Institute of Technology (1995 - 1997).

Member, Water Supply and Wastewater sub-committee, American Academy of Environmental Engineers, (1996- ).

Member, Plant Operation and Design Technical Advisory Committee for 100,000 gpd municipal package plant, Town of Saluda, North Carolina (1998 - 2002).



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6. *Final Technical Report, Cation Toxicity in the Anaerobic Digestion of Lime Sludge*, U.S. Army Medical Bioengineering Research and Development Laboratory, Technical Report 8205, 1982.
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11. *Engineering Report - Hamlet Sewage Treatment Plant Improvements, Town of Tuxedo, N.Y.*, Carpenter Environmental Associates, Inc., 1987.
12. *Expert Witness Report Evaluation of Lack of Compliance with NJPDES Permit, P. D. Oil & Chemical Storage, Inc., Bayonne, New Jersey*, Carpenter Environmental Associates, Inc., 1988.
13. *Final Report, Conceptual Design, Biological Nutrient Removal, Annapolis Water Reclamation Facility, Annapolis, Maryland*, Carpenter Environmental Associates, Inc., 1989.
14. *SPCC and ISC plans, ARDEC, Picatinny Arsenal, New Jersey*, Carpenter Environmental Associates, Inc., 1990. Updated 1999.
15. *Expert Witness Report Evaluation of Lack of Compliance with NJPDES Permit, Yates/Circuit Foil, Bordentown, New Jersey*, Carpenter Environmental Associates, Inc., 1992.
16. *New Lisbon Development Center Wastewater Treatment Plant Optimization Study*, New Jersey Department of Human Services, Carpenter Environmental Associates, Inc., 1992.

17. *Comparison of Dissolved Air Flotation and Conventional Clarification, Sand Island Wastewater Treatment Plant, Honolulu, Hawaii*, P.B. Melnyk, GMP Associates, Inc. and Carpenter Environmental Associates, Inc., 1994.
18. *Nitrification Toxicity Study, Mount Pocono (PA) Municipal Authority*, Carpenter Environmental Associates, Inc., 1994.
19. *Evaluation of Wastewater Treatment Plant, New Lisbon Development Center*, New Jersey Department of Human Services, Carpenter Environmental Associates, Inc., 1995.
20. *Wastewater Treatment Plant Preliminary Evaluation at Floyd Bennett Field*, U. S. Department of the Interior, Carpenter Environmental Associates, Inc., 1995.
21. *Expert Witness Report: Interference with Operation of the Hammond Sanitary District Wastewater Treatment Plant, Combined Sewer Overflow not in Compliance with Permit Conditions and Pollutant Loadings to the West Branch of the Grand Calumet River*, prepared for the USDOJ, Carpenter Environmental Associates, Inc., 1995, Updated 1999.
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23. *Evaluation Of and Comments on UPRC's Draft NPDES Permit*, Carpenter Environmental Associates, Inc., 2000.
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25. *Needs Assessment and Cost Estimate to Upgrade Tewksbury, NJ Wastewater Treatment Plant*, Carpenter Environmental Associates, Inc., 2001.
26. *Evaluation of Proposed Trickling Filter and Clarifier Upgrades at the Tinicum, PA Wastewater Treatment Plant*, Carpenter Environmental Associates, Inc., 2002.

Updated 7/30/03

## **APPENDIX B**

**UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF OHIO  
WESTERN DIVISION**

Sierra Club and Marilyn Wall,

Plaintiffs

v.

The Board of County Commissioners  
Of Hamilton County, The City of Cincinnati,  
And the Metropolitan Sewer District of Greater  
Cincinnati

Defendants

Case No. 1-02--135

Judge Sandra S. Beckwith

Magistrate Judge Jack Sherman

**DECLARATION OF BRUCE A. BELL, Ph.D., P.E., DEE**

I, Bruce A. Bell, state and declare as follows:

1. I am over 18 years of age and am competent to testify regarding the following:
2. I am president of Carpenter Environmental Associates, Inc. of Ramsey, New Jersey, an environmental engineering and science firm. I hold a Bachelor's degree in civil engineering, a Master's degree in environmental engineering, and a Ph.D. in environmental engineering, all from New York University. I am a registered professional engineer in New York and New Jersey. I am a diplomat of the American Academy of Environmental Engineers and serve on the committee that prepares the written and oral qualifying examinations for the Academy. I have over 32 years experience in the field of environmental engineering with expertise in wastewater collection and treatment. My experience includes the design and evaluation of collection systems, wastewater treatment plants and teaching of courses in environmental engineering at the undergraduate and graduate levels. My curriculum vita is attached as Appendix A.



3. A list of the documents I reviewed in preparing my Declaration is attached as Appendix B.
4. A sanitary sewer overflow (SSO) is any discharge or overflow of untreated sewage from a separate sanitary sewer system at any point other than a permitted discharge point, regardless of whether the discharge reaches waters of the United States. SSOs occur when flows exceed the capacity of a sewer. SSOs can be caused by high flows during wet weather conditions that exceed sewer capacity and/or by blockages such as grease, roots, debris, and pump station failures.<sup>1</sup> SSOs contain high levels of disease causing microorganisms, suspended solids, toxic pollutants, floatables, nutrients, oxygen-demanding organic compounds, oil and grease, and other pollutants.
5. SSOs can discharge to areas where they present high risks of human exposure such as streets, private property, basements, rivers, beaches, and other receiving waters. The disease causing microorganisms found in the discharge make SSOs a risk to human health. SSOs can also cause flooding and property damage. SSOs that reach receiving waters will adversely impact water quality and present a threat to aquatic organisms.<sup>2</sup>
6. Defendants' SSO rate is grossly higher than that of an average utility. Considering only the number of SSOs that occurred from the identified, numbered SSO locations and the entire length of sewers in both the combined and sanitary sewer system, Defendant's had a median of 50.42 SSOs per hundred miles per year from 1997 to 2001.
7. The SSO rate I calculated from Defendant's data is significantly lower than Defendant's real SSO rate for a number of reasons. First, I do not have available to me at this time the miles of sewers contained only in the separate sanitary sewer system and thus have used the total miles of sewers operated by Defendant. Defendants' actual SSO rate is higher than I calculated using total miles of sewers, because SSOs do not occur, by definition, in combined sewers. Second,

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<sup>1</sup> United States Environmental Protection Agency, "Sanitary Sewer Overflows What are they and how can we reduce them?", EPA 832-K-96-001, Summer 1996.

<sup>2</sup> United States Environmental Protection Agency, "Sanitary Sewer Overflows What are they and how can we reduce them?", EPA 832-K-96-001, Summer 1996.

not all, and perhaps not most, of Defendant's SSOs are included in the rate I calculated. A summary of manhole overflows, sewage surfacing, and basement backups from 1997 through 2001 provided by Defendants documents over 14,000 occurrences of manhole overflows, sewage surfacing, and basement backups during that five year period. These SSOs appear to be in addition to the numbered SSOs reported monthly by Defendants to the State of Ohio. From the data contained in the summary, it is clear that numerous SSOs were due to Defendants' actions or inactions. With further discovery, I would be able to determine how many more SSOs per 100 miles per year that were not reported to Ohio EPA are attributable to Defendants' conduct.

8. Recent benchmarking studies have documented median SSO rates of 5.06 SSOs per 100 miles<sup>3</sup>, 3.68 SSOs per 100 miles<sup>4</sup>, and 3.82 SSOs per 100 miles<sup>5</sup>. Defendants' median SSO rate from identified, numbered SSO locations only is from 10 to almost 14 times that of an average utility. Defendant's SSO rate is over 20 times higher than the rates experienced by best in class utilities<sup>6</sup>. Fairfax County Virginia, which operates a collection system of approximately 3,100 miles and has been actively pursuing a capacity, management, operation, and maintenance (CMOM) program since 1995, has reduced its average SSO rate for the last four years to under 2 SSOs per 100 miles per year.<sup>7</sup>
9. The Defendants' SSOs are ongoing and will continue to occur under the Interim Partial Consent Decree (IPCD) for many years to come.
10. The IPCD requires construction that will result in elimination of only 18 (or 19 if SSO 700 is included) out of 101 capacity related SSOs in the next 16 to 22 years. Again, 101 is just a number that is reported to Ohio EPA. It does not represent the total number of SSOs in the system.

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<sup>3</sup> Optimization of Collection System Maintenance Frequencies and System Performance, Prepared by Black & Veatch for the ASCE and the USEPA, February 1999.

<sup>4</sup> Protocols for Identifying Sanitary Sewer Overflows, Prepared by Black & Veatch for the ASCE and the USEPA, June 2000.

<sup>5</sup> Technical Memorandum: Overflow Reduction Targets, Prepared by HDR Engineering for the City of San Diego, April 2001.

<sup>6</sup> Technical Memorandum: Overflow Reduction Targets, Prepared by HDR Engineering for the City of San Diego, April 2001.

<sup>7</sup> <http://www.epa.gov/npdcs/sso/virginia/>

11. SSOs have been a violation of the Clean Water Act and of NPDES permits (including defendant's permit) since the Clean Water Act was passed in 1972 and since Defendants have had an NPDES permit.
12. There is a technologically feasible and simple remedy to prevent Defendant's capacity related SSOs that has been available in my direct experience for over 30 years. Defendants could have simply built sewers and treatment plants that were of adequate size for the wet weather flow that actually occurs.
13. In 1992 the Ohio Environmental Protection Agency issued a Director's Final Findings and Order (DFFO) that required Defendants to submit a plan with deadlines to eliminate all capacity related SSOs. Based upon information available to me, Defendants have never submitted such a plan with deadlines for elimination of all SSOs.
14. In my experience there is no technical reason that construction of adequate size sewers and necessary expansion of wastewater treatment plants could not have been completed within ten years of beginning such a program. For example, the City of Atlanta, Georgia has committed to a remediation program for wet weather overflows (in the case of Atlanta combined sewer overflows (CSO)) that began in 1998 and will be completed by mid-2007 that includes separation of approximately 25% of its combined sewer system, construction of 14 miles of tunnel ranging in diameter from 24 to 36 feet, two high rate chemically enhanced treatment systems (for CSOs), and upgrades at its wastewater treatment plants.
15. The IPCD requires planning for the elimination of capacity related SSOs, but specifically states that construction or implementation of these plans is not required under the IPCD and that construction or implementation shall only be required pursuant to future negotiations and/or a subsequent enforcement action (IPCD, § VII.E.2).
16. Planning for elimination of capacity related SSOs without requiring actual implementation of those plans will not assure elimination of capacity related SSOs. In my experience, I have never seen a Consent Decree that requires planning without requiring subsequent implementation of those plans.

17. The IPCD requires installation of a Chemically Enhanced High Rate Settling (CEHRS) and storage facility as an interim measure at SSO 700. SSO 700 is a highly active SSO that frequently discharges raw sewage in large volumes.
18. I have reviewed the literature and the predicted performance of such CEHRS systems at other locations. In my opinion, a CEHRS cannot meet the secondary treatment requirements required by the Clean Water Act and its implementing regulations.
19. Secondary treatment regulations require monthly average effluent biochemical oxygen demand (BOD) and total suspended solids (TSS) concentrations to be less than or equal to 30 mg/l. Weekly average effluent BOD and TSS concentrations must be less than or equal to 45 mg/l. In addition, secondary treatment systems must remove, on a monthly average basis, 85% of the influent BOD and TSS.
20. The literature indicates that a CEHRS cannot meet the secondary treatment concentration limits or the 85% percent removal requirement for BOD<sup>8</sup>.
21. The regulations at 40 CFR §133.103 provide for exemptions to the 85% removal requirements. Defendants cannot qualify for these exemptions. In order to qualify for exemption from the 85% removal requirement, Defendants must show that the system can meet secondary concentration effluent limits and that there is not excessive inflow and infiltration in its collection system. Defendants can make neither of these showings.
22. It is technically feasible to build a secondary treatment plant, which would comply with the secondary treatment requirements contained in the Clean Water Act and its implementing regulations to treat the discharges from SSO 700 within five years.
23. The IPCD allows new sewer hookups tributary to active SSOs provided that, based upon criteria and formulae a reduction of five gallons of flow is achieved for each gallon of flow added by new development. Verification of the calculated flow reduction is not required. This approach will unnecessarily extend the time that capacity related SSOs are active.

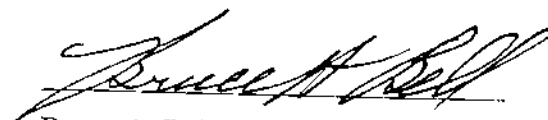
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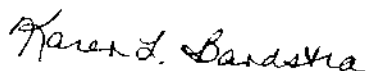
<sup>8</sup> A summary of ACTIFLO (a CEHRS system) performance prepared by the City of Atlanta indicates that less than 60% of influent BOD is removed by such systems.

24. It is clear that the Short-Term Adequate Capacity Plan (STACP) contained in the IPCD is not designed to eliminate active SSOs, but rather "The objective of the STACP Plan is to prevent any wastewater flows from new development from aggravating or in any way adding to the quantity discharged from any downstream SSO." (IPCD §VIII.C).
25. The IPCD perpetuates existing unpermitted capacity related SSOs by allowing additional raw sewage to be added to the collection system prior to providing the capacity to carry that sewage to a wastewater treatment plant without unpermitted discharges. In addition, the ongoing SSOs will contain higher pollutant concentrations because each 5 gallons of relatively clean storm water removed will be replaced by one gallon of raw sewage, which contains high concentrations of disease causing microorganisms as well as other pollutants.

I swear under the penalty of perjury that the foregoing is true and to the best of my knowledge and belief.

Executed on this day the 19 of April 2002.

  
Bruce A. Bell Ph.D., P.E., DEE



KAREN L. BANDSTRA  
NOTARY PUBLIC OF NEW JERSEY  
MY COMMISSION EXPIRES 3/13/07

## **APPENDIX C**

**UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF OHIO  
WESTERN DIVISION**

Sierra Club and Marilyn Wall.

### Plaintiffs-Intervenors

**V.**

The Board of County Commissioners  
Of Hamilton County, The City of Cincinnati,  
And the Metropolitan Sewer District of Greater  
Cincinnati

## Defendants

Case No. 1-02--107  
Consol w/ C-1-02-135  
Judge S. Arthur Spiegel  
Magistrate Judge  
Timothy S. Hogan

## SECOND DECLARATION OF BRUCE A. BELL, Ph.D., P.E., DEE

I, Bruce A. Bell, state and declare as follows:

1. I am over 18 years of age and am competent to testify regarding the following:
2. I am president of Carpenter Environmental Associates, Inc. of Ramsey, New Jersey, an environmental engineering and science firm. I hold a Bachelor's degree in civil engineering, a Master's degree in environmental engineering, and a Ph.D. in environmental engineering, all from New York University. I am a registered professional engineer in New York and New Jersey. I am a diplomate of the American Academy of Environmental Engineers and serve on the committee that prepares the written and oral qualifying examinations for the Academy. I have over 32 years experience in the field of environmental engineering with expertise in wastewater collection and treatment. My experience includes the design and evaluation of collection systems, wastewater treatment plants and teaching of courses in environmental engineering at the



undergraduate and graduate levels. My curriculum vita is attached as Appendix A.

3. I have approximately 30 years of experience providing litigation support in Clean Water Act enforcement actions. I have worked with USEPA and USDOJ as an expert witness since the early 1970s. I have participated in cases that have gone to trial where I provided expert witness testimony. The majority of cases in which I have been involved have settled. In those cases, I participated in settlement negotiations and assisted in preparing the technical portions of Consent Decrees. In addition, I have provided similar services to citizen plaintiffs in Clean Water Act citizen suits since approximately 1980.
4. The following statements and opinions are made with a reasonable degree of engineering certainty.
5. Unlike the Interim Partial Consent Decree (IPCD) at issue in this case, virtually all of the Consent Decrees in which I have participated, including those prepared by USEPA and USDOJ, have required, in addition to planning, construction of the identified remedial actions, and a deadline for construction of those remedies. In addition, all of those Consent Decrees have required the payment of civil penalties and have meaningfully stipulated penalties for continued SSOs in violation of the Consent Decree and/or failure to meet required deadlines set forth in the Consent Decree. In my opinion, these provisions are crucial to motivating a polluter to bring itself into compliance with the Clean Water Act.
6. The IPCD fails to bring Defendants into compliance, or even require significant progress towards compliance with the Clean Water Act and Defendants' permits for a number of major reasons, including:
  - a. Failure to require a fixed final completion date for the specific construction projects required by the IPCD and identified in Attachment 3 of the IPCD.
  - b. Failure to require implementation of projects identified by Defendants' Capacity Assurance Project planning.
  - c. Inclusion of an inadequate operation and maintenance (O&M) program, coupled with an inability to collect stipulated penalties unless Plaintiffs

can prove that a SSO resulted from Defendants' failure to implement its O&M program.

- d. Replacement of removed I/I with raw sewage from new sewer connections, thus perpetuating illegal capacity related SSOs.
  - e. Failure to address in any meaningful way the over 2,500 backups of raw sewage into basements every year.
  - f. Implementation of a remedy at SSO 700 (Defendant's highest volume discharge SSO point) that does not comply with the secondary treatment requirements of the Clean Water Act. It is technically feasible to construct a remedy that would comply with the Act. Because of the arbitrary cost cap on the SSO 700 interim measure, the modification of the IPCD proposed by the United States to include disinfection will necessarily result in a smaller treatment facility than originally contemplated.
7. Attachment 3 to the IPCD lists 8 projects (now modified to 9 projects) scheduled to eliminate 16 of the 101 active, documented SSO locations over the next 5 years. The IPCD however does not require that these projects be completed on the scheduled date, if ever. The IPCD allows Defendants to modify any of these projects based upon modeling results along with the schedule for that project. Given time, an engineer can always design a better project. Without a real, enforceable deadline, there is no incentive for Defendants to actually complete these projects. Rather, the incentive exists to constantly modify each project to continually push the required completion date further into the future.
  8. The IPCD requires construction that will result in elimination of only 16 (or 17 if SSO 700 is included) out of the 101 reported capacity related SSOs in the next 16 to 22 years. The 101 numbered SSO locations that are reported to Ohio EPA do not represent the total number of SSOs in the system. There are thousands of occurrences of sewage backing up into basements each year and an additional number of SSOs, such as overflowing manholes, that occur at locations other than the numbered SSO locations reported to Ohio EPA by Defendants.
  9. The United States Memorandum in Support of Motion for Entry of Consent Decree (US Memorandum) claims that implementation of the CIP projects will

eliminate "all of defendants' "highly active" and (thus worst) SSOs". The proposed projects will not, in fact, eliminate all of Defendants' highly active SSOs. Three of the top ten most active (greatest number of discharges from January 1997 through November 2001) and five of the top 17 most active SSOs are not addressed at all in the Capital Improvement Projects contained in Attachment 3 to the IPCD.

10. The IPCD requires planning for the elimination of capacity related SSOs, but specifically states that construction or implementation of these plans is not required under the IPCD and that construction or implementation shall only be required pursuant to future negotiations and/or a subsequent enforcement action (IPCD, § VII.E.2).
11. Planning for elimination of capacity related SSOs without requiring actual implementation of those plans with a fixed completion date will not assure elimination of capacity related SSOs. In my experience, I have never seen a Consent Decree that requires planning without requiring subsequent implementation of those plans. Taking away the important motivating aspect of a fixed compliance deadline actually does more harm than good and appears to reward Defendants for their past delay in complying with the 1992 State of Ohio orders.
12. The O&M program required by the Consent Decree is inadequate to address non-capacity related SSOs, in that it requires less frequent cleaning of sewers and root removal from sewers than performed by the average utility, and significantly less frequent cleaning and root removal than required by EPA in recent actions.
13. A comparison of the O&M plan (Attachment 7 to the IPCD) to O&M frequencies from a benchmarking study performed for USEPA<sup>1</sup> clearly demonstrates the inadequacy of Defendants' O&M plan. The benchmarking study looked at 42 systems ranging in size from 32 to 5,700 miles of sewer and averaging 1,660 miles of sewer. The median SSO rate in the systems studied was 5.06 SSO per 100 miles of sewer per year, far less than Defendants' over 50 SSO per 100 miles

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<sup>1</sup> Black and Veatch and the American Society of Civil Engineers, "Optimization of Collection System Maintenance Frequencies and System Performance," EPA Cooperative Agreement #CX824902-01-0, February 1999.

per year. The average utility in the study cleaned 30% of its system each year. The IPCD only requires Defendants to clean 6.3% of its system per year. Utilities in the study averaged root cutting in 4% of their systems each year. The IPCD only requires Defendants to cut roots (or use chemical treatment for roots) in 0.3% of its system each year.

14. O&M requirements contained in the IPCD are inconsistent with and far more lenient than recent EPA actions in other cities with which I am familiar. For example, in April 2002, EPA issued an Administrative Order to the City of San Diego whose sewer system is almost identical in size to Defendants'. San Diego's SSO rate is less than 20% of Defendants' SSO rate. The Administrative Order issued by EPA requires San Diego to clean approximately 1,500 miles of its sewer system each year for the next two years (50% of San Diego's system) while Defendants are required to clean only 185 miles of sewer each year (6.3% of its system). EPA's Administrative Order requires San Diego to rehabilitate or replace 60 miles of sewer each year for the next 10 years while Defendants are only required, under the IPCD, to rehabilitate or replace 10 miles of sewer each year despite a far worse SSO rate than experienced by San Diego. EPA's Administrative Order requires San Diego to maintain sufficient staff to administer an aggressive grease control program that includes permitting and inspection of food service establishments because grease is a major cause of blockages in sewers resulting in SSOs. The IPCD does not require Defendants to take any actions to prevent or reduce grease discharges to its system.
15. The inadequacy of the O&M requirements contained in the IPCD is further exacerbated by the fact that the IPCD does not really require that Defendants perform the specified actions each year. Compliance with the IPCD is measured by averaging three years performance. The IPCD further weakens the O&M requirements by requiring that in order to collect stipulated penalties for O&M related SSOs, Plaintiffs are required to prove that the SSO resulted from a failure of Defendants' O&M program. In my opinion, proving that a particular SSO occurred as the result of a particular O&M failure is nearly an impossible task.

16. It is clear that the Short-Term Adequate Capacity Plan (STACP) contained in the IPCD is not designed to eliminate active SSOs, but rather “The objective of the STACP Plan is to prevent any wastewater flows from new development from aggravating or in any way adding to the quantity discharged from any downstream SSO.” (IPCD §VIII.C). In other words, the sole objective of the STACP Plan is to maintain the existing conditions.
17. The IPCD allows new sewer hookups tributary to active SSOs provided that, based upon criteria and formulae, a reduction of five gallons of flow is achieved for each gallon of flow added by new development. This approach will unnecessarily extend the time that capacity related SSOs are active by continuing to allow additional flows to overloaded sewers without first determining the maximum carrying capacity of the sewer.
18. The IPCD perpetuates existing unpermitted capacity related SSOs by allowing one gallon of additional raw sewage to be added to the collection system for each five gallons of rainwater removed prior to providing adequate sewer capacity to carry that sewage to a wastewater treatment plant. In addition, the ongoing SSOs will contain higher pollutant concentrations because each five gallons of storm water removed will be replaced by one gallon of raw sewage, which contains higher concentrations of disease causing microorganisms as well as other pollutants.
19. The STACP fails to even ensure that the predicted flow reductions assumed from I/I removal actions are verified to be real. The IPCD allows Defendants to request higher credits if verification supports such increases but provides no requirement to inform Plaintiffs if actual flow reductions are less than the assumed credits. Defendants have no requirement or motivation to reduce the assumed credits to reflect real flow reductions, thus the IPCD will serve to perpetuate illegal SSOs.
20. Sewer moratoria are commonly used to prevent additional raw sewage from entering the sewer system before adequate conveyance and treatment facilities are in-place. Sewer moratoria not only prevent capacity related SSOs and capacity related effluent violations at treatment facilities, they also provide a strong

26. Mr. Klingenstein, in his Declaration<sup>2</sup>, correctly attributes capacity related SSOs to the failure of Defendants' to provide adequate conveyance capacity in its sewers and/or to prevent excessive I/I into its sewers. He also correctly attributes non-capacity related SSOs to blockages caused by insufficient O&M. In my opinion, the IPCD fails to require that Defendants actually construct adequate sewer capacity and fails to require the level of O&M required to eliminate or minimize non-capacity SSOs.
27. Mr. Klingenstein, in his Declaration, indicates that the projects to eliminate (or reduce the frequency of) 16 SSOs required by the IPCD were originally required by a draft Ohio Director's Final Findings and Orders (DFFO) prior to USEPA entering into negotiations with Defendants. He fails to mention that the Ohio EPA Director's Final Findings and Orders was issued as final in 1992 and that 10 years later these projects have not been built as required by the DFFO.
28. Mr. Klingenstein also testifies in his Declaration that Defendants understand that these projects must be of adequate size to prevent SSOs for a 10-year, 24-hour rain event. Mr. Klingenstein failed to include in his Declaration the fact that the IPCD contains no such requirement.
29. Mr. Klingenstein, in his Declaration, admits that the CEHRS and Storage Facility required by the IPCD will only, according to Defendants, reduce current discharges of raw sewage at SSO 700 by 75%. Mr. Klingenstein relies on Defendants' estimates for even this partial reduction of raw sewage discharge. Apparently, EPA has done no estimates of its own. The IPCD fails to mandate even the partial treatment allowed by CEHRS for all of the raw sewage currently being discharged at SSO 700. It is not clear whether Defendant's estimates of the fraction of raw sewage that can be partially treated at the facility is accurate, considering that the facility must now be smaller to spend the same amount of money and include disinfection.
30. Mr. Klingenstein testifies that Defendants "prefer" to use a tunnel, funded in major part by the Corps of Engineers, to eliminate SSO 700 in about 15 years.

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<sup>2</sup> Declaration of Mark J. Klingenstein, P.E. in Support of Motion by the United States for Entry of the Interim Partial Consent Decree, August 13, 2002.



- incentive for the utility to address capacity issues in a timely fashion. The IPCD does not impose a sewer moratorium, but rather allows additional sewer hookups as a reward for removing I/I, which Defendants' should already be aggressively removing in an attempt to reduce or eliminate capacity related SSOs.
21. People served by Defendants' sewer system experience thousands of backups of raw sewage into their basements each year not related to problems with homeowners' sewer laterals. Raw sewage inside of homes presents a health risk to all who may come into contact with the raw sewage. In addition, cleanup of raw sewage inside of homes represents a serious economic burden.
  22. Backups of raw sewage into basements are caused both by insufficient capacity in Defendants' sewers and by blockages in Defendants' sewers that are O&M related. The IPCD does little to remedy these conditions.
  23. The IPCD requires installation of a Chemically Enhanced High Rate Settling (CEHRS) and storage facility as an interim measure at SSO 700. SSO 700 is a highly active SSO that frequently discharges raw sewage in large volumes. The modification to the IPCD requires the addition of disinfection at the CEHRS facility.
  24. In my first Declaration, I discussed the inability of such CEHRS systems to meet the secondary treatment requirements required by the Clean Water Act and its implementing regulations. In addition, in my first Declaration, I opined that a secondary treatment system to treat the discharge from SSO 700 is both technically feasible and can be constructed within five years.
  25. Notwithstanding the fact that the CEHRS is not permittable under the federal CWA, the modifications to the IPCD have effectively reduced the size of any facility that would be built under the IPCD at SSO 700. Modifications to the IPCD have added a requirement to provide disinfection at the CEHRS facility. The modifications, however, left in place the \$10,000,000 floor and \$15,000,000 cap on construction costs for the facility contained in the original IPCD. Because significant monies must be spent to provide disinfection, the entire facility will be smaller, and would, therefore, store and partially treat less raw sewage than contemplated under the original IPCD.



There is no guarantee, however, that the tunnel will be funded by the Corps or by Hamilton County or that it will ever be built. Making a significant part of the schedule to achieve compliance with the Act contingent upon such a speculative venture as the Mill Creek Deep Tunnel further leads me to the conclusion that the IPCD does not provide a reasonable basis to achieve compliance with the Act.

31. Mr. Klingenstein speculates that there may not be room for a secondary treatment plant, as I suggested, on the site; that there may be opposition to a secondary treatment plant; that more stringent effluent limits than secondary treatment may be required if a permit is required from Ohio EPA; and that the five year time to complete I estimated for a secondary treatment plant is "unlikely" due to Defendants' contracting procedures and other hurdles. Mr. Klingenstein has not analyzed any of these issues, but merely speculates.
32. Mr. Klingenstein expresses concern (with no technical analysis) that high peak flows may be an issue in the design and operation of the plant. High peaking factors due to wet weather flows can be addressed in the design of a secondary treatment plant through storage flow equalization, process design, and selective chemical addition.
33. Mr. Elmaraghy, in his Affidavit<sup>3</sup>, concludes that more stringent than secondary treatment at SSO 700 would likely be required to allow a discharge permit under Ohio's rules and regulations. Mr. Elmaraghy admits that treatment more stringent than secondary treatment is likely needed at SSO 700, yet supports the CEHRS treatment for SSO 700 that would provide less than secondary treatment, apparently with no permit and no monitoring.
34. Mr. Elmaraghy questions whether a biological treatment facility could operate under the variable flow conditions at SSO 700. His concerns, lack of food for the biomass during non-overflow conditions and high peak flows washing out biomass can be easily addressed during process selection and design. The biomass can easily be maintained by routing a portion of the flow in the sewer to the secondary plant at all times. As discussed previously, process design, storage,

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<sup>3</sup> Affidavit of George Elmaraghy, August 13, 2002.

flow equalization, and selective chemical addition can be used to deal with peak flows.

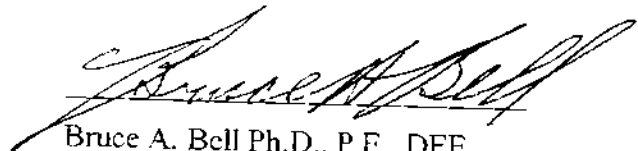
35. Mr. Simpson, in his Affidavit<sup>4</sup>, opines that the STACP, by requiring five gallons of I/I be removed from the system before one gallon of raw sewage can be added is more protective of the environment than a sewer moratorium alone. This is because the IPCD fails to require Defendants to carry out infiltration/inflow (I/I) removal in order to reduce or eliminate illegal SSOs. A moratorium combined with a requirement that Defendants take all available actions to reduce or eliminate illegal SSOs, would result in significantly less pollutants being discharged to the environment than does the IPCD. In my experience, this is one of the most highly motivating actions that can be taken to quickly bring a municipal violator into compliance with the Clean Water Act.
36. The IPCD fails to require actual construction of needed remedies, fails to address thousands of discharges of raw sewage into basements, and allows a remedy for the worst of Defendants' SSOs (SSO 700) that will continue to result in the discharge of raw sewage from that SSO and that could not be permitted under USEPA and Ohio EPA regulations. The IPCD also allows new sewage flows to be connected to Defendants' system, which obviously cannot handle the flows that it already is receiving without illegal SSOs.
37. The changes to the IPCD made after the United States received the Sierra Club and citizen comments are, in the words of the United States, "minor modifications." From an engineering standpoint, I agree with this statement. The changes made to the IPCD are of minor engineering significance in the overall context of Defendants violations and do not change my opinions in any way that this decree is inadequate to bring Defendants into compliance with the law.

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<sup>4</sup> Affidavit of James Simpson, August 13, 2002.

I swear under the penalty of perjury that the foregoing is true and to the best of my knowledge and belief.

Executed on this day the 9<sup>th</sup> of September 2002.



Bruce A. Bell Ph.D., P.E., DEE

## **APPENDIX D**

## CONSTRUCTING CONVENTIONAL TREATMENT PLANT AT OR NEAR SSO 700.

### Advantages of Conventional Treatment Plant

1. Conventional treatment plant would be considered a permanent solution to discharges from SSO 700.
2. Diverting the waste flow from the sewershed upstream of SSO 700 would reduce the load entering the Mill Creek WWTP.
3. Water quality of Mill Creek downstream of the discharge point would be improved due to effluent limitations imposed under an NPDES Permit for a treatment plant versus untreated flows currently being discharged from SSO 700 under wet weather conditions which are unregulated.
4. By properly sizing the plant, capacity would be available to provide service to northern Hamilton County and southern Butler County as it develops.
5. Conventional treatment can be designed to produce an effluent containing relatively low concentrations of contaminants.

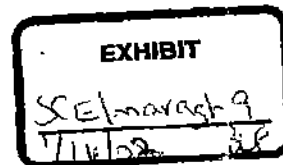
Construction of a conventional treatment facility would likely result in a successful antidegradation review and issuance of a PTI due to the following:

- Elimination of SSO 700.
- Improvement of the existing water quality in Mill Creek.
- Reduction in pollutant loads entering the Mill Creek WWTP.

A conventional treatment facility near the location of SSO 700 would capture approximately 70% to 80% of all flows generated in the East Branch Mill Creek Drainage Basin. Only a small portion of the EBVC basin found south of the SSO would continue to contribute flows to the Mill Creek WWTP.

Preliminary review of the following available instream flows, water quality, along with dry and wet weather flows from the 42 inch main line sewer was reviewed to determine if construction of a conventional treatment plant was feasible.

- Mill Creek Dry weather Flow: 20.29 cfs (Field measurement on 6/16/99 near SSO 700)
- Temperature: 25.5°C (Field measurement on 6/16/99 near SSO 700)
- pH: 7.99 S.U. (Field measurement on 6/16/99 near SSO 700)
- Dry weather flow (42 inch sewer): 21.7 cfs (14 MGD--Mark Kron)
- Wet weather flow (42 inch sewer): 35.6 cfs (23 MGD--Mark Kron)



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Comparison of Dry and Wet Weather Sampling Results, 1999

PARAMETER	DRY WEATHER RESULTS	WET WEATHER RESULTS
Fecal Coliform	450 #/100 ml	96400 #/100 ml
<i>E. coli</i>	290 #/100 ml	18000 #/100 ml
TSS	26 mg/l	268 mg/l

A conventional treatment plant with the following effluent quality should be acceptable to the Ohio EPA, and should result in issuance of a PTI.

PARAMETER	30-DAY LIMIT	7-DAY LIMIT	MAXIMUM/MINIMUM LIMIT
CBOD <sub>5</sub> (mg/L)	10.0	15.0	n/a
Total Suspended Solids (mg/L)	12.0	18.0	n/a
NH <sub>3</sub> -N (mg/L)-summer winter	1.0 3.0	1.5 4.5	n/a
Dissolved Oxygen (mg/L)	n/a	n/a	6.0 (minimum)
Total Residual Chlorine (mg/L)	n/a	n/a	0.038 (maximum)